

BMJ Open Mapping the existing evidence of the effects of school food policies on health, acceptance and affordability of secondary school children in Europe: a scoping review protocol

Janina Meuer ¹, Nadia Blecha,² Wiebke Hübner,¹ Lara Christianson ³,
Maike Wolters,² Heide Busse,¹ Antje Hebestreit,² Sarah Forberger ^{1,4}

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For numbered affiliations see end of article.

Correspondence to

Janina Meuer;
meuer@leibniz-bips.de

ABSTRACT

Introduction Unhealthy diets pose a significant public health risk among European children, contributing to the increasing prevalence of overweight and non-communicable diseases. Children spend a substantial amount of time at school daily, including lunchtime, so the school setting becomes crucial for promoting healthy diets and lifestyle habits. While there is a large body of literature on the impact of school food policies on health and non-health outcomes, it is essential to identify which policies are effective and can be recommended for implementation to ensure the efficient use of resources. This article presents a protocol for a scoping review that aims to map the current published literature on the effects of school food policies on health outcomes, acceptance and affordability in secondary school children in Europe. Moreover, the scoping review will map the measurements used to assess health outcomes, acceptance and affordability.

Methods and analysis The scoping review protocol and review follow the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Review. To identify eligible studies, we will search MEDLINE, PsycINFO, CINAHL and Web of Science. The reference lists of the included articles will be checked for additional studies. In addition, country-specific ministry reports from Member States of the European Union, the UK, Norway, Iceland and Switzerland will be identified. The WHO and European Commission websites will also be searched for relevant reports. The scoping review will include literature published until 20 September 2023. No restrictions to study design and language will be applied. Screening and data extraction will be carried out independently by three reviewers. Disagreements will be resolved by discussion. A pretested data charting table will be used to extract key information. Findings will be presented in tabular and visualised summaries and a narrative summary.

Ethics and dissemination This scoping review does not require ethical approval. Our dissemination strategy comprises peer-reviewed publications, conference presentations and recommendations to policy-makers.

STRENGTHS AND LIMITATIONS OF THIS STUDY

- ⇒ The scoping review targets literature focusing on secondary school children, which is currently rarely researched.
- ⇒ It provides a methodological overview of approaches to assess health outcomes, acceptability and affordability of school food policies for European secondary school children.
- ⇒ The literature search will be conducted in the most important databases and additionally extended to country-specific ministry reports from Member States of the European Union (EU), the UK, Norway, Iceland and Switzerland. Further, the WHO and European Commission websites will be searched for relevant reports. Thus, the most important sources for relevant publications will be covered.
- ⇒ This scoping review will be limited to peer-reviewed published literature and WHO/EU reports and country-specific ministry reports of the EU Member States, the UK, Iceland, Norway and Switzerland until 20 September 2023; this may bias the analysis by excluding potentially relevant sources.
- ⇒ The literature search will focus on Europe, which may limit the generalisability of findings to other countries and systems.

INTRODUCTION

According to the WHO, non-communicable diseases account for 74% of all deaths yearly worldwide.¹ Non-communicable diseases, such as diabetes, cardiovascular diseases and cancer, are associated with dietary consumption patterns and weight gain.^{2 3} In recent decades, eating patterns worldwide have shifted from unprocessed, nutrient-dense, low-energy foods towards diets high in sugar, saturated fat, energy and ultra-processed food items.^{4 5} However, a healthy diet is fundamental to leading a long and healthy life.⁶ Specifically, early childhood is a crucial

period for learning and habituating good dietary habits, with evidence suggesting that patterns internalised at this age may persist throughout adulthood.^{7–10} On the other hand, an unhealthy diet jeopardises children's future by affecting their cognitive, physical and social development.^{10–16} These delays have profound implications for children's future health and well-being, preventing them from achieving their full potential, escaping poverty and participating in society.¹⁵

Over the past decades, overweight and obesity have become significant public health issues among European children, affecting one in three school-aged children and one in four adolescents.¹⁷ In response to this health issue, notable efforts have been made to combat this trend, including the European Union (EU) action plan on childhood obesity 2014–2020¹⁸ and the WHO's 2006 guidance paper supporting the development of school nutrition programmes in the European Region.¹⁹ Recently, policy-makers have focused on schools as a suitable environment to establish healthier eating habits. Schools can potentially reach a large share of children regardless of socioeconomic status (food security), gender, cultural background²⁰, and over a decade of their life.²¹ As schools are environments where food policies and practices can be implemented to reach a large proportion of children,²² they can be seen as critical settings for interventions encouraging healthy eating patterns on-site and at home because the school food policy reaches children, their families and community members. One way in which schools can support children's health, apart from food education inside and outside the classroom, is by providing healthy meals through canteens or cafeterias.²³

As outlined in the EU action plan on childhood obesity 2014–2020, school meal provision can play a crucial role in establishing a healthier environment for children,¹⁸ as it complements children's daily dietary intake and plays a fundamental part in calorie and nutrient control. However, there is little evidence of health outcomes due to the lack of programme evaluation.²⁴ Moreover, health outcomes depend on the quality and modalities of the school meal provision.²¹ As studies analysing health outcomes of school food interventions mostly contain multiple interventions (eg, education, food provision, promotion of healthy diet), the solemn effect of school meals on health is hard to confine. A review by Chaudhary *et al*²² found that school-based food and nutrition interventions can affect healthy eating and improve dietary behaviour, attitude and anthropometry. Van Cauwenberghe *et al*²⁵ confirmed these findings, as they found evidence for the effectiveness of especially multi-component interventions on the dietary behaviour of school-aged children in the EU countries. Evidence was inconclusive regarding the effects of interventions on anthropometric measures.²⁵

Providing well-balanced school meals is a promising way to improve children's health and well-being. However, meals must be affordable to ensure regular uptake. Although school meals are an integrated part of every

school in Europe, the organisation of meal provision varies across and within nations. Funding arrangements differ between universal free school meals and governmental and/or parental subsidise.^{20 21}

Irrespective of the scope of food provision and financial arrangements, students' and parents' acceptance of school meals is crucial for the programme's effectiveness and the economic success of school meal providers. Literature suggests numerous factors involved in the acceptability of school meals, such as meeting and availability of food preferences, physical and cultural environment and pricing.^{26 27} Despite its importance, there is currently no consensus on which measure should be used to assess the acceptability of school meals.²⁷

While the literature on school food policies is broad, evaluations of those focusing on school meals regarding health impact on secondary school children (10–18 years), acceptability and affordability are scarce. Hence, the evidence of outcomes and impacts of school meal policies is still limited. Given the need for synthesising evidence of the effectiveness of school meal policies on the health of secondary school children in Europe, the foreseen scoping review aims to fill this gap. Findings from the scoping review will assist policy-makers in designing appropriate nutrition intervention policies targeting secondary school children in Europe. In this paper, the protocol for the scoping review is outlined.

Study objective and research questions

The scoping review aims to synthesise the evidence and assess the scope of the literature relating to the effectiveness of school food policies, particularly those focusing on improving full school meals, health outcomes, acceptability and affordability among students in European secondary schools. The following research questions will be addressed:

- What types and scope of school food policies targeting full meals are being addressed in the literature with a focus on:
 - Health (any reported health outcome).
 - Acceptance by different stakeholders (secondary school children, teachers, school administrators, parents, as reported).
 - Affordability.
 - What implementation measures are being used to increase the uptake and maintenance of the school food policy?

Furthermore, methodological aspects are of interest:

- What frameworks are used in the literature to analyse school food policies?
- What methods are used to evaluate health, acceptability, affordability and implementation (eg, standardised scales, interviews)?

Further, this scoping review will help to identify evidence gaps in this area.

METHODS AND ANALYSIS

This protocol describes the methods for a scoping review. The Preferred Reporting Items for Systematic Reviews

Table 1 Inclusion and exclusion criteria according to PICO (population, intervention, comparator, outcomes, study design)

PICOs	Inclusion	Exclusion
Population	▶ Children in secondary school (ISCED level 2 and 3/ ages 10–18) within EU Member States, the UK, Norway, Iceland, Switzerland.	▶ Literature focusing on primary school-age children ▶ Literature covering countries outside of EU Member States, Norway, Switzerland, Iceland, the UK
Intervention	▶ School food policies aiming at improving school full meals.	▶ Policies focusing solely on snacks, vending machines or changes in beverages ▶ Parents packed lunch boxes ▶ Breakfast club ▶ School fruit or milk programmes ▶ Research projects
Outcomes	▶ Health ▶ Acceptability ▶ Affordability ▶ Implementation determinants	
Study design	▶ Primary studies published in peer-reviewed journals ▶ WHO, EU and country-specific ministry reports of the EU Member States, the UK, Norway, Iceland and Switzerland assessing the effectiveness of school meal policies	▶ No reviews, conference abstracts, bachelor, master and dissertation theses

EU, European Union; ISCED, International Standard Classification of Education.

and Meta-analysis for Protocol extension for Scoping Reviews checklist was used to draft this protocol (see online supplemental appendix 1).

Eligibility criteria for selecting studies for inclusion

Studies meeting all the following criteria will be considered for inclusion in the scoping review. Eligibility for inclusion into the scoping review is based on the P (population), I (intervention), C (Context/setting) and O (outcome) criteria (table 1).

Types of participants and setting

The target population will be children and adolescents who attend secondary school (International Standard Classification of Education (ISCED) level 2 and level 3²⁸) in Europe. According to the European Commission, pupils entering the ISCED level 2 are typically between 10 and 13 years old. Students finishing ISCED level 3 are generally around age 17 or 18 years old.²⁹ Therefore, the scoping review will include articles focusing on children and young adolescents between 10 and 18 years. Studies based on special-needs schools will be included as well. Studies that report only combined results for primary and secondary schools will be included if the authors report the data separately. Otherwise, studies will be excluded.

The setting will be limited to secondary schools in Europe. This scoping review defines Europe as all EU Member States and additionally includes Switzerland, Norway, Iceland and the UK.

Types of interventions

Policies targeting full school meals will be assessed. By full meals, we mean school lunches served in canteens

or cafeterias. Breakfast club, lunch boxes provided by parents and policies focusing solely on snacks, beverages and vending machines will not be discussed. No restriction regarding the policy's implementation level (local, regional and national) will be made.

In this scoping review, policies are defined, according to Lobczowska *et al.*,³⁰ 'as actions developed and implemented to achieve specific goals within a society, with national or regional governments participating in the development and/or implementation of these actions. In contrast, interventions are actions targeting similar goals, not yet endorsed, enabled or executed by regional or national governments' but, for example, through research projects, initiatives or programmes funded by foundations, research programmes or associations are excluded.

Types of outcomes

We focus on the impact of school food policies, particularly improvements in full meals, on students' health (health outcome reported in the primary study), acceptability and affordability (outcome reported in the prior studies). However, it should be noted that all these outcomes can be significantly influenced by the implementation process. Effective implementation is crucial in order to translate policy intentions into tangible benefits for students. Incorporating implementation determinants as an additional focus in our scoping review emphasises their central role in determining the success or failure of school food policies. By including implementation determinants, we aim to provide a comprehensive overview of the contextual factors contributing

to the observed impacts of school food policies in European secondary schools. This approach ensures that our scoping review not only evaluates the intended outcomes but also considers the practical aspects that underpin the success of these interventions in real-world educational settings.

We will include studies that report on health and/or acceptability, and/or affordability but not on implementation determinants in our scoping review. Studies focusing solely on implementation determinants without addressing health outcomes, acceptability or affordability will be excluded from our analysis.

Types of study design

Primary studies with any designs (qualitative and/or quantitative methods) will be considered for inclusion. Grey literature will be included but limited to authoritative documents or reports and WHO and EU reports. The WHO, EU Commission websites and country-specific ministry reports of the EU Member States, the UK, Iceland, Norway and Switzerland, will be searched.

Information sources and search strategy

Relevant studies will be searched in the following electronic databases: MEDLINE, PsycINFO, CINAHL and Web of Science. We will search papers published in peer-reviewed journals until 20 September 2023. Keywords, MeSH and other index terms, as well as combinations of these using Boolean operators, will be used to construct the search strategy. An interprofessional team comprising experts in health sciences, sociology, epidemiology, nutrition, psychology and social sciences collaborated to develop the search strategy. This was guided by an experienced research librarian and tailored to each database. An iterative technique adapted from JBI's three approach was used for the development. A preliminary search was conducted on MEDLINE based on an initial set of key terms. The retrieved papers were reviewed regarding their topical fit. Keywords, synonyms and index terms were identified from the retrieved papers and used to revise the search strategy. A second search was undertaken across all included databases using all identified keywords and index terms. Retrieved papers were tested according to their topical fit. For example, the MEDLINE search strategy can be found in online supplemental appendix 2. A third step, screening the reference lists, will be performed with all included full-text papers. In addition to the electronic sources, the WHO and EU Commission websites will be searched for relevant reports. Country-specific ministry reports of the EU Member States, the UK, Norway, Iceland and Switzerland, will also be identified.

Study/source selection process

All identified references will be imported into the Endnote reference manager version to remove duplicates. After removal, the remaining references will be uploaded to Covidence (<http://www.covidence.org>). First, all titles and abstracts of potentially relevant studies identified by

the database searchers will be screened independently by three reviewers (WH, NB and JM) against the inclusion criteria. Second, the three reviewers will screen the full-text articles and document the reasons for exclusion. Any disagreements will be resolved by discussion. If no agreement can be reached at the title/abstract screening stage, the paper will be included in the full-text screening. In the case of conflicts in the full-text screening, conflicts are resolved by discussion. If no agreement can be reached, a fourth person not involved in the screening process will be consulted.

Data extraction

Three independent reviewers will systematically extract data from eligible articles. A data extraction sheet will be designed and pilot-tested before use based on three included studies to standardise data extraction. The following characteristics of the included studies will be extracted and entered into Excel spreadsheets: first author, corresponding author, year of publication, country, study title, study design, aim, the number of participants, participant characteristics, description of the setting, number of schools, description of the policy and, if applicable, control arms. The following points will be extracted: framework, intervention duration, frequency, intensity and content of the components and intervention outcomes (ie, results on effectiveness of intervention; health and health measurement, acceptability and acceptability measurement, affordability and affordability measurement), implementation steps, level of jurisdiction (national, subnational, city), legal quality (hard/soft law), instruments (which instruments were used: eg, tax relief, free school meals, subsidies) and actor (who is responsible for the programme). If information needs to be included, the authors will contact the corresponding author of any included study with missing information relevant to the charting form via email.

For large projects, the questions addressed in this scoping review may be divided into several papers. Therefore, the homepages of the projects will be searched to see if further papers can be included based on the identified project. Further identified papers are included as hand searches and screened analogously to the studies identified in the databases.

Assessment of methodological quality

An assessment of the methodological quality of articles is not envisioned because of the broad inclusion of study designs.

Collecting, summarising and reporting the results

Data will be charted and displayed graphically, diagrammatically or tabularly where appropriate and accompanied by a narrative summary. The narrative summary will explain how the results relate to the review's objective and question(s) and include qualitative and quantitative synthesis approaches. Data will be summarised and grouped into similar categories based on commonalities.

Some examples of themes that could be used to organise the results are: study type, country, framework, outcome measures and practice recommendations/implications. No overall assessment of the strength of the evidence will be performed, as evaluating the quality of the individual studies will not be the purpose of this scoping review.

Patient and public involvement

No patients or members of the public were involved in developing the scoping review protocol.

ETHICS AND DISSEMINATION

No ethical approval for this review is required, as data will be obtained from publicly available materials. This protocol is registered on the Open Science Framework (<https://osf.io/rg7dy>). Essential protocol amendments postregistration will be recorded and included in dissemination. The results of this scoping review will be published in a peer-reviewed journal and possibly presented at conferences. We will provide recommendations and conclusions based on the findings from the synthesis.

Author affiliations

¹Prevention and Evaluation, Leibniz Institute for Prevention Research and Epidemiology - BIPS, Bremen, Germany

²Epidemiological Methods and Etiological Research, Leibniz Institute for Prevention Research and Epidemiology - BIPS, Bremen, Germany

³Administration, Leibniz Institute for Prevention Research and Epidemiology - BIPS, Bremen, Germany

⁴Department of Health Science, University of York, York, UK

X Sarah Forberger @forberger_sarah

Contributors The corresponding author attests that all listed authors meet authorship criteria and that no others meeting the criteria have been omitted. AH, MW, HB and SF conceived the idea and contributed to the writing and revision of the manuscript. JM, NB and WH developed the research questions and study methods. NB and LC developed the search strategy. JM drafted and edited the manuscript with AH, MW, HB and SF providing critical revisions to the manuscript. The final version of the manuscript was read and approved by all authors. SF acted as guarantor.

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ORCID iDs

Janina Meuer <http://orcid.org/0009-0005-5154-0562>

Lara Christianson <http://orcid.org/0000-0002-7780-255X>

Sarah Forberger <http://orcid.org/0000-0002-7169-675X>

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